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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference F-214-PCT	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR2002/001245</b>	International filing date (day/month/year) <b>29 JUNE 2002 (29.06.2002)</b>	Priority date (day/month/year)
International Patent Classification (IPC) or national classification and IPC  <b>IPC7 C09K 11/06</b>		
Applicant  <b>PARK, SOOYOUNG et al</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of \_\_\_\_\_ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>29 JANUARY 2004 (29.01.2004)</b>	Date of completion of this report  25 OCTOBER 2004 (25.10.2004)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer  CHOI, Seung Keun  Telephone No. 82-42-481-5575 

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2002/001245

## I. Basis of the report

## 1. With regard to the elements of the international application:\*

- ☒ the international application as originally filed
- ☐ the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the drawings:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

## 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide** and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheet \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

## INTERNATIONAL PRELIMINARY EXAMINATION

International application No.

PCT/KR2002/001245

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	1-3	YES
	Claims		NO
Inventive step (IS)	Claims	1-3	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-3	YES
	Claims		NO

**2. Citations and explanations (Rule 70.7)**

Reference is made to the following documents:

D1: JP 2000-91077 A

D2: JP 2001-123156 A

D3: JP 11-17576 A

The present invention relates to a branched  $\alpha$ -cyanostilbene fluorescent represented by chemical formula 1, capable of being used in an electroluminescent display, which is an organic material comprising a stilbene moiety and a branch of phenyl at the distal end in powder, solution, or film state, wherein tuning colors such as red, green, and blue is possible according to a stilbene structure, and the luminescent feature becomes higher in a solid state than in liquid state. Claims 1-3 relate to an organic electroluminescent composition containing  $\alpha$ -cyanostilbene compound.

D1 relates to an organic electroluminescent element which includes a styryl compound represented by formula 1 in an organic layer of its luminescent region between cathode and anode in order to provide high luminance. D2 relates to a polymeric fluorescent substance which includes a polymeric phosphor comprising one or more kinds of repeating units represented by chemical formulas 1-3 in a luminescent layer between cathode and anode. D3 relates to a polymeric fluorescent substance comprising a charge transport layer adjacent to a luminescent layer including a polystyrene polymeric phosphor represented by chemical formula 1 between cathode and anode.

The present invention is different from D1-D3 in its purpose for providing a polymeric fluorescent compound capable of tuning colors such as red, green, and blue, whereas D1-D3 is to provide a high-efficient organic luminescent element by using a polymeric fluorescent having high luminance.

(Continued on Supplemental Sheet)

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

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Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of:

Box V

They are different in the technical feature: the organic luminescent compound of the present invention has a structure containing a biphenyl structure as a cyanostilbene having substituents at both ends; the styrene compound of D1 is an organic luminescent compound comprising 4 phenyl groups with 3 vinyl groups therebetween and two amine groups at both distal ends of phenyl groups; the polystyrene of D2 is a polymer of polystyrene comprising repeating units; and D3 discloses an organic luminescent compound having a phenyl group having octyloxy as a substituent and vinyl groups as a substituent at both ends. In addition, the subject matter of the present invention shows its luminescence feature even in powder, solution, or film state; can be used for high efficient displaying device capable of tuning colors depending on R1 of chemical formula 1; and shows thermostability, which is not disclosed in D1-D3. Accordingly, it is not considered to be obvious to a person skilled in the art to apply the knowledge of these documents individually or in combination in order to create a -cyanostilbene compounds according to the invention claimed in claims 1- 3.

Thus, claims 1-3 are novel and inventive under PCT Article 33(2)-(3).

Claims 1-3 directed to an organic luminescent compound which is useful for manufacturing an organic electroluminescent element showing the luminescent feature in powder, solution, and a film are industrially applicable under PCT Article 33(4).